

REMARKS

This is in response to the Office Action that was mailed on July 21, 2004. Examiner Maier will recall that this application has previously undergone extensive prosecution before another Examiner. During the course of that prosecution, Applicants made several amendments of the claims in the hopes that such amendments – even though they were not in Applicants’ opinion necessary and/or even desirable – would expedite the prosecution of this application. The present Amendment revises the claims to more closely reflect the original claim structure and the corresponding disclosure herein. (See e.g. page 25 defining a slurry pH value in the form of a slurry. Regarding claim 26, see lines 5-20 on page 19.) No new matter is introduced by the present Amendment. With this Amendment, claims 1-13, 18, 20, 23, and 27 are in the application.

Claims 1-13, 18, 20, 23, 26, and 27 were rejected under the second paragraph of 35 U.S.C. §112 as failing to define the invention properly. As suggested by the Examiner, Applicants have amended the terminology “cellulose triacetate” back to the original “cellulose acetate” throughout the claims. The Examiner indicated that although claim 1 is a compound claim, the feature (ii) includes other components. Thus, the examiner suggests to recite the expression “a composition comprising a cellulose (tri)acetate”. Applicants respectfully urge that their present usage of the terminology “cellulose acetate” is proper, since cellulose acetate

has a sulfonic acid group which is neutralized with a basic metal component, and accordingly the terminology "cellulose acetate" in the present context is well known and accepted by those skilled in the relevant art as including a compound comprising a metal (e.g., alkaline earth metal) component. Regarding the amount of metal in claim 26, Applicants have now defined the total amount of metal (alkali metal and alkaline earth metal) in claim 26 as 0.01×10^{-6} to 5×10^{-6} equivalent, based on page 19, lines 5-20, of the specification. It is respectfully urged that the claims in their present form satisfy the requirements of the statute.

Claims 1-10, 18, 26, and 27 were rejected under 35 U.S.C. §102(b) as being anticipated by JP 2-251607 (UENISHI). Claims 1-13, 18, 26, and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over UENISHI in view of US 3,952,081 (EPSTEIN). With respect to anticipation, the Examiner argued that these claims are rejected as being anticipated by UENISHI, since "commercial cellulose acetate contains small amounts of free carboxylic and acid sulfate group" as shown in CAMPBELL (US 3,755,297, column 3, lines 23-25), and the burden is on Applicant to show a novel or unobvious difference the claimed product and the prior art product.

UENISHI discloses as follows: "The present inventors found that a small amount of metal ions contained in the raw-material cellulose ester causes thread breakage. In other words, the precipitation of metal ions causes the formation of heterogeneous threads, which affects the properties of the threads adversely, to generate the thread

breakage. — An attempt was made to increase the operational stability by addition of an organic acid having two or more carboxyl groups and/or a salt thereof to a cellulose ester solution for forming a chelate complex and trapping metal ions, which are the cause of thread breakage.” (JP text: page 2, the upper left column, line 9 to the upper right column, line 2). “A spinning method comprising extruding a solution of cellulose ester in an organic solvent from a nozzle, which is characterized in that the solution contains an organic acid having two or more carboxyl groups and/or a salt thereof” (claim 1). Regarding cellulose ester, the UENISHI reference discloses “a derivative such as cellulose acetate, cellulose triacetate, etc.; a mixed cellulose ester such as cellulose acetate butyrate, cellulose acetate propionate, etc. — When cellulose acetate is used, the degree of acetylation of the cellulose acetate is mainly 30 to 65% usually” (JP text: page 2, the upper right column, lines 7-13). Further, “as the organic acid having two or more carboxyl groups use in the present invention includes citric acid, oxalic acid, EDTA, etc. and the salts thereof. It is preferable that the carboxyl groups are in close each other in the molecule. As for the amount of the organic acid, it needs to add the organic acid in a proportion of 0.5 to 5 mol, preferably 1.0 to 3.0 mol relative to the very small amount of metal ions contained in the cellulose ester solution” (JP text: page 2, the lower left column, lines 14 to the lower right column, line 1). In Example, citric acid (20 ppm) is admixed with a cellulose acetate solution (comprising cellulose triacetate of 30% and N-methyl pyrrolidone of 70%). According to the UENISHI invention, “the present invention provides a spinning method of cellulose ester fiber in which the

thread breakage is extremely inhibited with a highly excellent operability" (Effects of the Invention).

CAMPBELL is directed to the preparation of the secondary cellulose ester and discloses that "commercial cellulose acetate contains small amounts of free carboxyl and acid sulfate groups". However, CAMPBELL fails to teach the free carboxyl group and sulfonic acid group in relation to the metals, particularly the slurry pH.

EPSTEIN refers to a cellulose acetate filamentary material, the reference fails to teach the free carboxyl group and sulfonic acid group in relation to the specific metals.

UENISHI fails to teach or suggest the presently claimed invention, alone or in view of CAMPBELL and/or EPSTEIN. UENISHI teaches the addition of the organic acid of 0.5 to 5 mol relative to the very small amount of metal ions contained in the cellulose ester solution (dope) to form a chelate complex with metal ions for improving the thread breakage. However, since the amount of the organic acid having two or more carboxyl groups and/or a salt thereof is 0.5 to 5 mol relative to the very small amount of metal ions, the pH value of the dope is an acidic pH lower than 4.5. If necessary, Applicants are prepared to submit a declaration for showing a slurry pH value of UENISHI's cellulose acetate.

In more detail, UENISHI adds the organic acid having two or more carboxyl groups and/or a salt thereof relative to the metal ions in a proportion of 0.5 to 5 mol. Thus, even if the metal ion consists of an alkaline earth metal ion, the equivalent ratio

of acids having two carboxyl groups relative to the metal ion is 0.5 to 5 equivalent, and the equivalent ratio of acids having three carboxyl groups (such as citric acid) relative to the metal ion is 0.75 to 7.5 equivalent. Therefore, the cellulose acetate containing 0.5 mol or more of the polyvalent acids expects to show a lower pH value than 4.5, and UENISHI fails to teach the slurry pH. Furthermore, UENISHI fails to teach the cellulose acetate containing the polyvalent acids, since UENISHI add the polyvalent acids to the dope (a solution of cellulose acetate). Also, UENISHI is also silent the relationship between free carboxyl groups and the sulfonic acid groups, which sulfonic acid groups form metal salts preferentially.

Clearly, the presently claimed invention is not anticipated by the disclosure of UENISHI, even as modified by CAMPBELL and/or EPSTEIN.

Claims 1-3, 13, 18, 20, 23, 26, and 27 were rejected under 35 U.S.C. §102(b) as being anticipated by WO 96/30412 (KIYOSE). CAMPBELL was cited to support alleged inherency. The Examiner said that these claims are rejected as being anticipated by KIYOSE (equivalent reference US 5,663,310), since the examples 1-5 do not disclose the addition of a base to neutralize the catalyst. Claims 1-3, 13, 18, 20, 23, 26, and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over KIYOSE.

The KIYOSE reference (see US 5,663,310) discloses: "A process for preparing a cellulose acetate characterized by having an average degree of acetylation of not less than 59%, viscosity average degree of polymerization (DP) of not

less than 290 and concentrated solution viscosity (η), according to the falling ball viscosity method for viscosity average degree of polymerization (DP), expressed by the following formula (1): $2.814 \times \ln(\text{DP}) - 11.753 \leq \ln(\eta) \leq 7.28 \times \ln(\text{DP}) - 37.059$ (1), comprising the steps of activating cellulose with acetic acid and reacting the activated cellulose with acetic anhydride in the presence of 10-15 parts by weight of a sulfuric acid catalyst, based on 100 parts by weight cellulose" (claim 1), and "The process for preparing a cellulose acetate according to claim 1, wherein the average degree of acetylation of the product cellulose acetate is from 59 to 62.5%" (claim 4). Further, KIYOSE mentions "Presently, commercially available cellulose acetates may be roughly divided into two groups according to the degree of acetylation thereof. One is cellulose triacetate (hereinafter referred to as CTA) having a degree of acetylation of not less than 59%" (column 1, lines 22-28). Furthermore, "Cellulose acetate is produced by a process wherein cellulose is activated with acetic acid, etc., and triacetate is prepared with acetic anhydride using a sulfuric acid catalyst, then the degree of acetylation is adjusted by saponification (hydrolysis)" (column 3, lines 60-66). Moreover, in Examples 1-5, cellulose triacetate was obtained by the above method (i.e., without neutralization by a basic metal component), and in Examples 6-8, cellulose triacetate was obtained by neutralization with magnesium acetate.

KIYOSE teaches cellulose triacetate having a high acetylation degree which is obtained by acetylation without neutralization with a basic metal component, and thus the reference fails to teach cellulose acetate containing metals. Further, though Examples 6-8 disclose cellulose acetate obtained by neutralization with magnesium acetate, KIYOSE fails to teach the proportion of magnesium acetate in relation to free carboxyl groups and sulfonic acid groups and the slurry pH. In particular, it is noted that Examples 1-5 of KIYOSE uses a large amount of sulfuric acid catalyst (i.e., 10-15 parts by weight relative to 100 parts by weight cellulose. Thus, the slurry of cellulose triacetate would show a lower pH value than 4.5. If necessary, the Applicants are prepared to submit a Declaration establishing the difference between the claimed subject matter and KIYOSE.

Clearly, the presently claimed invention is not anticipated by or obvious from the disclosure of KIYOSE, alone or in view of CAMPBELL.

UNEXPECTED RESULTS. In addition to the points made above, it is pointed out that the present invention provides unexpected results. That is, since UENISHI uses a large amount of acids relative to metal ions, the acids accelerate the hydrolysis of cellulose acetate in the dope. Since KIYOSE uses a large amount of sulfuric acid catalyst and the resultant cellulose acetate has a high concentration of sulfonic acid groups, the hydrolysis of cellulose acetate would be accelerated. Thus, these references would not improve the stability of cellulose acetate.

CAMPBELL and EPSTEIN, as well as UENISHI and KIYOSE, fail to teach improvement of film-releasability from a support.

In contrast, in accordance with the present invention, the film-releasability from the support can be significantly improved, since the present cellulose acetate contains a little or small amount of the specific acid to generate free carboxyl groups. Further, since the present cellulose acetate contains a specific amount of metals, free carboxyl groups can be generated while retaining high heat resistance.

This is apparent from the Examples herein. That is, in Examples 1 and 2, the citric acid content of 7.7×10^{-7} mole (Example 1) or 6.8×10^{-8} mole (Example 2) relative to the alkaline earth metal content of 6.2×10^{-6} (see Comparative Example 1) corresponds to the equivalent ratio of 0.83 or 0.073. Such a cellulose acetate -- having a small amount of acids -- improves film-releasability from the support with maintaining high heat resistance. This benefit of the present invention is neither taught nor suggested by any of the references of record.

Conclusion

For any questions, the Examiner is respectfully requested to contact Richard Gallagher (Reg. No. 28,781) at (703) 205-8008.

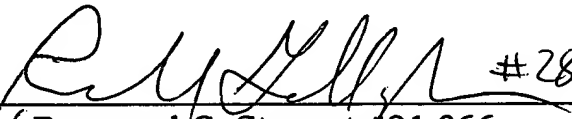
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Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of two (2) months to December 21, 2004 in which to file a reply to the Office Action. The required fee is enclosed.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 CFR 1.16 or under 37 CFR 1.17, particularly extension of time fees.

Respectfully submitted,

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